THE INVENTION CLAIMED IS:

1. An apparatus for restricting axial leakage flow through the clearance between a rotating shaft and a seal stator and providing necessary damping to improve rotor stability comprising:

said shaft having a stepped surface, said surface having a plurality of sections of a first diameter and a plurality of sections of a second lesser diameter being interleaved and adjacent;

said seal stator having a plurality of damper sections and a plurality of labyrinth sections, said sections of damping and labyrinth being interleaved and adjacent;

said damper sections of the seal stator adjacent the shaft section of first diameter to provide damping; and

said labyrinth sections of the seal stator adjacent the shaft of second diameter to form a tortuous flow path for reducing seal leakage.

2. The seal stator according to claim 1, wherein the damper sections are slotted pocket segments.

3. The seal stator according to claim 1, wherein the damper sections are honeycomb segments.

4. The seal stator according to claim 1, wherein the damper sections are hole pattern segments.